

Short Answer

Answer the following questions with complete sentences in your own words. You are encouraged to conduct your own research online or through other methods before answering the questions. If you research online, please consult multiple sources before you write down your answers. You are expected to be able to explain your answers in detail (Provide examples for each question).

1. What is the aggregate function? How do you use it?
2. Can aggregate functions be used without having and group by? Can it be used with having but not group by? If so, what would the result be? If not, why?
3. What's the difference between WHERE clause and HAVING clause?
4. What are joins? What are the basic types of joins?
5. What kind of relationship does self-join imply? Can you give an example of self-join?
6. What are sub-query? What are the different types of sub-queries?
7. What are set operators? How is it different from a join?
8. What are the differences between UNION and UNION ALL? What are some rules you have to follow when you use set operators?
9. What are the views? How is it different from a table? What happens if you modify data on view?
10. What is a user-defined stored procedure? Why do you need it?
11. What are indexes? Why are they needed?
12. Is the index always useful? Do you want to create as many indexes as possible? Why or why not?
13. How is data stored if there is no clustered index? What about when you create a clustered index?
14. What is a B+Tree? What are roots and leaf nodes in a B+Tree? How many children can you have in a B+Tree?
15. What are the differences between clustered and non-clustered indexes?

Coding Questions:

All questions are based on AdventureWorks data warehouse unless otherwise specified. (We only have internet sales in our data warehouse)(note: I remove some tables in the data warehouse, so it only has internet sales in the database)

1. Find the total Internet sales tax amount.
2. Find the Internet sales amount per order by year and quarter of order date.
3. Find the percentage of sales amount for each order over total sales amount of that month by shipping date.
4. Display the full name, age, address(City, State, Country), and marital status of all customers who live in the US
5. Create a view with the product sold amount by subcategory by category by year and month order date.
6. Use the view created to display product sold amount by category by year of order date.
7. deleted
8. Group the customers into different age groups: < 30, 30-50, and 50+. Get the total number of customers and a total number of Internet sales in each group.
9. Create a stored procedure to input the first or last name of the customer, and return the Internet sale orders the customer(s) have created.
10. Create a stored procedure to display the total number of sales and sales amount for each month by category, with a specified year.
11. Create a function that will calculate the Hypotenuse of a triangle after you give the length of the two other sides of a triangle.

Use sub-queries to complete the following questions

13. Find the name of the customers who have made more than one purchase on the Internet.